BAB V

PERENCANAAN BALOK B2

5.1 Direncanakan Balok WF 250 x 125 x 6 x 9

$Wk := 29.6$ kg/m	$Ak := 37.66$ cm^2	$Zx := 352$ cm^3
$h := 250$ mm	$ix := 10.4$ cm	$Zy := 72$ cm^3
$b := 125$ mm	$iy := 2.79$ cm	$G := 80000$ Mpa
$tf := 9$ mm	$Ix := 4050$ cm^4	$E := 200000$ Mpa
$tw := 6$ mm	$Iy := 294$ cm^4	
	$Lb := 100$ cm	

Mutu Baja BJ 37 :

$fy := 240$ Mpa

$fu := 370$ Mpa

- Kontrol Kuat Geser

$$\frac{h}{tw} = 41.67$$

$$\frac{1100}{\sqrt{fy}} = 71$$

karena $\frac{h}{tw} < \frac{1100}{\sqrt{fy}}$ (penampang plastis)

$$Vn := 0.6 \cdot 10 \cdot fy \cdot \left(\frac{h \cdot tw}{100} \right) = 21600 \text{ kg}$$

$$\phi Vn := 0.9 \cdot Vn = 19440 \text{ kg}$$

Dari hasil perhitungan SAP didapatkan nilai, $Vu := 6326.59$ kg $<$ $\phi Vn = 19440$ kg

- Kontrol Kuat Momen Lentur
  - Local Buckling

SAYAP	BADAN
$\frac{b}{2 \cdot tf} = 6.94$	$\frac{h}{tw} = 41.67$
$\frac{170}{\sqrt{fy}} = 10.97$	$\frac{1680}{\sqrt{fy}} = 108.44$

Penampang kompak sehingga Mn= $Mp := Zx \cdot 2400 = 844800$ kgcm

- Lateral Buckling

$Lb := 100$ cm (pasang balok pengaku t = 8 mm jarak 100 cm)

Dari Tabel Ir. Marwan Ibrahim perhitungan panjang Lp dan Lr untuk profil balok didapatkan :

BJ 37 didapatkan nilai $Lp := 141.751 \quad cm$

$Lr := 445.869 \quad cm$

Lb < Lp < Lr sehingga balok termasuk bentang pendek

Dari hasil perhitungan SAP didapatkan nilai

$Mn := Mp = 844800 \quad kgcm$

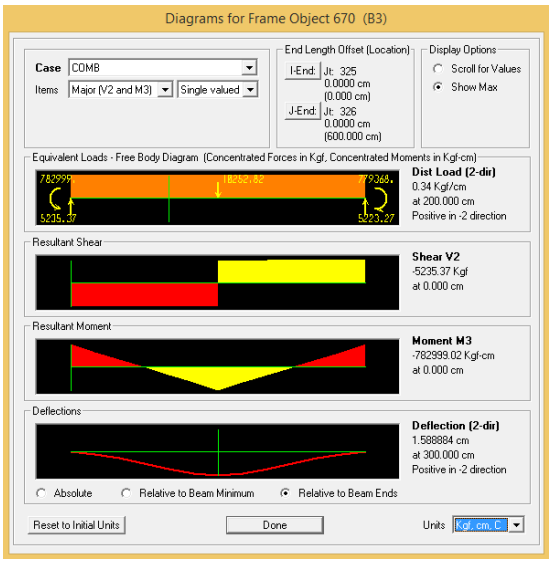
$\phi Mn := \frac{0.9 \cdot Mp}{100} = 7603.2 \quad kgm$ ▮ > ▮ $Mu := 6402.48 \quad kgm$ (Output SAP 2000)

5.2 Kontrol lendutan

$L := 600 \quad cm$

lendutan izin $fijin := \frac{L}{360} = 1.67 \quad cm$

Lendutan akibat beban envelope hasil SAP



$\Delta := 1.589 \quad cm$ ▮ < ▮ $fijin = 1.67 \quad cm$ OK..!